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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/083,094

02/26/2002

Martin Smith

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23644

7590

10/27/2005

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EXAMINER

AGHDAM, FRESHTEH N

ART UNIT

PAPER NUMBER

2631

DATE MAILED: 10/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/083,094

Applicant(s)

SMITH ET AL.

Examiner

Freshteh N. Aghdam

Art Unit

2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 12 and 14 are objected to because of the following informalities:

As to claims 12 and 14, the word "channels" lacks antecedent basis on line 3.

Appropriate correction is required.

Response to Arguments

Applicant's arguments see page 6, filed 8/17/2005, with respect to the rejection(s) of claim(s) 1-14 under Rudrapatna (US 6,801,790) have been fully considered and are persuasive. Therefore, the rejection and objections to claims 7 and 8 have been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Wegner (US 6,728,554), Rudrapatna (US 6,801,790), and Lindoff et al (US 6,700,882).

Claim Rejections - 35 USC § 102

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 4-6, 9-11, and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Wegner (US 6,728,554).

Art Unit: 2631

As to claim 1, Wegner teaches a radio communication device comprising a plurality of antenna elements (Fig. 1, means 24); a combiner (Fig. 1, means 14, 18, and 20) arranged to adaptively combine the antenna elements such that two or more diverse directional antenna beams are provided to receive two or more inputs (Col. 2, Lines 15-25), the combiner being arranged to couple the inputs to two or more receive chains (Fig. 1, means 16; Col. 4, Lines 3-55); and wherein there are more antenna elements than receiver chains (Fig. 1; Col. 5, Lines 44-47).

As to claim 2, Wegner teaches a multiple input multiple output communications device and wherein the combiner is arranged such that the two or more directional antenna beams are suitable for multiple input multiple output communications (Fig. 1).

As to claim 4, Wegner teaches the antenna beams are diverse as a result of any of polarization diversity, angle diversity, and space diversity (Fig. 1; Col. 2, Lines 15-25; Col. 4, Lines 3-16; Col. 5, Lines 1-11).

As to claim 5, Wegner teaches that the combiner comprises at least one beamformer (Fig. 1, means 14).

As to claim 6, Wegner teaches that at least some of the antenna elements are provided as a phased array (Col. 2, Lines 15-25; Col. 5, Lines 1-11).

As to claim 9, Wegner teaches that the combiner is arranged to electronically steer the directional antenna beams (Fig. 1, means 14 and 18).

As to claim 10, Wegner teaches a communication network comprising a plurality of radio communications devices (Col. 1, Lines 11-16).

As to claim 11, Wegner teaches a method of operating a radio communication device comprising the steps of: receiving radio signals at a plurality of antenna elements by using a combiner to adaptively combine the antenna elements such that they are operable in at least one direction to receive two or more diverse inputs and coupling the inputs to two or more receive chains; and wherein there are more antenna elements than receive chains (Fig. 1; Col. 1, Lines 61-Col. 2, Line 25; Col. 4, Lines 1-67; Col. 5, Lines 1-61 and 44-47).

As to claim 13, Wegner teaches a method of operating a radio communication system comprising transmitting radio signals from a plurality of antenna elements by processing signals on two or more transmit chains to produce two or more processed signals; using a combiner to adaptively combine the antenna elements such that they are operable in at least one direction to transmit the two or more processed signals as diverse outputs; and wherein there are more antenna elements than transmit chains (Fig. 1; Col. 1, Lines 61-Col. 2, Line 25; Col. 4, Lines 1-67; Col. 5, Lines 1-61 and 44-47).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wegner,

Art Unit: 2631

and further in view of Lidoff et al (US 6,700,882).

As to claim 3, Wegner teaches all the subject matters claimed above, except for the radio communication device being a user terminal. Lindoff teaches that a mobile station with 2 or more antenna elements (antenna array system) that enables the mobile station to have a better coverage and data throughput per link (Fig. 8; Col. 8, Lines 24-49). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Lindoff with Wegner in order to enable mobile station to have a better coverage and data throughput per link.

Claims 7-8, 12, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wegner, and further in view of Rudrapatna (US 6, 801,790).

As to claim 7, Wegner teaches all the subject matters claimed above, except for a pair of antenna beams with substantially orthogonal polarizations and at substantially similar directions. Rudrapatna teaches a pair of antenna beams with substantially orthogonal polarizations and at substantially similar directions (Fig. 1, Col. 5, Lines 8-37). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Rudrapatna with Wegner in order for the antenna array to be able to transmit or receive signals, which are relatively highly correlated to allow for beam forming/ steering operations (Fig. 1 and 2; Col. 5, Lines 25-35).

As to claim 8, Wegner teaches all the subject matters claimed above, except for a pair of antenna beams with substantially orthogonal polarizations and at substantially similar directions but being at a different direction from said pair of antenna elements. Rudrapatna teaches a pair of antenna beams with substantially orthogonal polarizations

Art Unit: 2631

and at substantially similar directions but being at a different direction from said pair of antenna elements (Fig. 1 and 2; Col. 5, Lines 8-37). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Rudrapatna with Wegner in order for the antenna array to be able to transmit or receive signals, which are relatively highly correlated to allow for beam forming/ steering operations (Fig. 1 and 2; Col. 5, Lines 25-35).

As to claims 12 and 14, Wegner teaches that the radio communication system is a multiple input multiple output communications device and the diverse channels are multiple input multiple output channels. Wegner is silent about the received signals are space-time coded. Rudrapatna teaches that the received signals are space-time coded (Col. 1, Lines 46-50; Col. 3, Lines 38-41). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Rudrapatna with Wegner in order to improve the quality of the signal being transmitted or received by the antenna array using a spatial diversity technique (Col. 1, Lines 16-40).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within


Art Unit: 2631

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Freshteh N. Aghdam whose telephone number is (571) 272-6037. The examiner can normally be reached on Monday through Friday 9:00-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


KEVIN BURD
PRIMARY EXAMINER

Application/Control Number: 10/083,094
Art Unit: 2631

Page 8

Freshteh Aghdam

October 19, 2005